

Amendments to the Claims:

1. (Currently Amended) A fluid pump controlling system comprising,
the- a fluid pump (10) comprising a piston displaceable-displaceably positioned in a
cylinder, the cylinder having a piston displacement stroke and the cylinder having a stroke end,
the fluid pump (10) being driven by an electric motor fed by electric voltage; -the system being
characterized by comprising:

- a sensing assembly (11) to measure measuring the behavior of the piston, and
- an electronic controller (16) to control the electric voltage, the electronic controller
(16) associated-being electrically connected to the sensing assembly (11), the electronic
controller (16) monitoring-being arranged to monitor the displacement of the piston within the
cylinder by detecting an impact signal, the impact signal being transmitted by the sensing
assembly (1) upon occurrence of an impact of the piston with the stroke end, the impact signal
being transmitted by the sensing assembly (11) to the electronic controller (16), the electronic
controller (16) being configured to successively incrementing-increment the piston displacement
stroke by increasing the voltage fed to the electric motor, the voltage increment being controlled
by a from the trigger signal until the occurrence of the impact to store a maximum value of piston
displacement corresponding to the piston displacement as far as the stroke end.

2. (Currently Amended) A system according to claim 1, wherein characterized in that the
maximum value of piston displacement corresponds to a displacement of maximum efficiency
of the fluid pump (10).

3. (Currently Amended) A system according to claim 2, wherein characterized in that the
trigger signal is generated by the electronic controller (16) upon occurrence of a problem ~~on~~ of
the fluid pump (10).

4. (Currently Amended) A system according to claim 1, wherein characterized in that the
fluid pump (10) is actuated with a minimum piston displacement stroke.

5. (Currently Amended) A system according to claim 3, wherein characterized in that the
fluid pump (10) is actuated upon occurrence of the trigger signal.

6. (Currently Amended) A system according to claim 5, ~~characterized by further~~ comprising:
_____ a first filtering circuit (40) ~~associated~~ electrically connected to the electronic controller (16), the first filtering circuit (40) being of the high-pass type, the impact signal read by the sensing assembly (11) being filtered by the first filtering circuit (40) and being fed to the electronic controller (16).

7. (Currently Amended) A system according to claim 6, ~~wherein characterized in that~~ the sensing assembly (11) comprises an impact sensor (35) electrically connected ~~associated to~~ the cylinder of the fluid pump (10).

8. (Currently Amended) A system according to claim 7, ~~wherein characterized in that~~ the impact sensor (35) comprises an accelerometer fixed together with the cylinder of the fluid pump (10).

9. (Currently Amended) A system according to claim 5, ~~wherein characterized in that~~ the sensing assembly (11) comprises a position sensor (36) of the piston displacement stroke, the position sensor (36) being electrically connected ~~associated to~~ the electronic controller (16).

10. (Currently Amended) A system according to claim 4, ~~wherein characterized in that~~ the sensing assembly (11) comprises a second filtering circuit (42), electrically connected ~~associated~~ with an electronic controller (16), the second filtering circuit (42) being of the low pass type, the signal read by the sensing assembly (11) being filtered by the second filtering circuit (42) and being fed to the electronic controller (16), the signal read being filtered by the second filtering circuit (42) and corresponding to a signal of piston displacement within the cylinder.

11. (Currently Amended) A system according to claim 10, ~~wherein characterized in that~~ the signal of piston displacement within the cylinder is transmitted to the electronic controller (16), the electronic controller (16) preventing the piston displacement as far as the stroke end.

12. (Currently Amended) A fluid pump (10) controlling system comprising:
_____ ~~the~~ a fluid pump (10) comprising a piston ~~displaceable~~ displaceably positioned in a cylinder, the cylinder having a piston displacement stroke and the cylinder having a stroke end,

the fluid pump (10) being driven by an electric motor fed by electric power, ~~the system being characterized by comprising:~~

- a piston-position sensing assembly (11), and
- an electronic controller (16) electrically connected ~~associated to~~ the sensing assembly (11), the electronic controller (16) monitoring the piston displacement within the cylinder by detecting an impact signal, the impact signal being transmitted by the sensing assembly (11) upon occurrence of an impact of the piston with the stroke end, the impact signal being transmitted by the sensing assembly (11) to the electronic controller (16);

the electronic controller (16) successively incrementing the piston displacement stroke from a trigger signal until the occurrence of impact to store a maximum value of piston displacement, and monitoring the piston displacement within the cylinder and preventing displacement as far as the maximum value of piston displacement.

13. (Currently Amended) A system according to claim 12, wherein characterized in that the electronic controller (16) prevents piston displacement as far as the stroke end by decrementing the level of voltage applied to the motor.

14. (Currently Amended) A system according to claim 13, characterized by further comprising:

- a first filtering circuit (4) electrically connected ~~associated to~~ the electronic controller (16), the first filtering circuit (40) being of the high-pass type, the impact signal read by the sensing assembly (11) being filtered by the first filtering circuit (40) and being fed to the electronic controller (16).

15. (Currently Amended) A system according to claim 14, wherein characterized in that the sensing assembly (11) comprises an accelerometer fixed close to the cylinder of the pump fluid (10), the impact signal being generated by the accelerometer.

16. (Currently Amended) A system according to claim 13, wherein characterized in that the sensing assembly (11) comprises a position sensor (36) to sense the piston displacement, the position sensor being electrically connected ~~associated to~~ the electronic controller (16).

17. (Currently Amended) A system according to claim 13, ~~wherein characterized in that~~ the sensing assembly (11) comprises a second filtering circuit (42), electrically connected ~~associated to~~ the electronic controller (16), the second filtering circuit (42) being of the low pass type, the signal read by the sensing assembly (11) being filtered by the second filtering circuit (42) and being fed to the electronic controller (16), the signal read being filtered by the second filtering circuit (42) and corresponding to a signal of piston displacement within the cylinder.

18. (Currently Amended) A fluid pump controlling method, the fluid pump (10) comprising a piston displaceably positioned in a cylinder,

- the cylinder having a piston displacement stroke, and
- the cylinder having a stroke end, wherein the method being characterized by ~~comprising comprises~~ the steps of:

(a) monitoring the piston stroke in the cylinder to detect an impact thereof with the stroke end,

(b) monitoring the piston stroke for a stabilization time, and

(I) incrementing the piston stroke if no impact occurs during the stabilization time and repeating the step (b), or

(II) decrementing the piston stroke if an impact occurs during the stabilization time.

19. (Currently Amended) A method according to claim 18, ~~wherein characterized in that~~, prior to the step (a), a step of incrementing the piston stroke is performed.

20. (Currently Amended) A method according to claim 19, ~~wherein characterized in that~~, prior to the step of incrementing the piston stroke, the fluid pump (10) is started with a minimum piston displacement stroke.

21. (Currently Amended) A method according to claim 20, ~~wherein characterized in that~~ the step of starting the fluid pump (10) with a minimum piston displacement stroke is carried out upon initiating the functioning of the fluid pump (10).

22. (Currently Amended) A method according to claim 21, ~~wherein characterized in that~~ the step of starting the fluid pump (10) is carried out periodically.

23. (Currently Amended) A method according to claim 22, ~~wherein characterized in that~~ the step of starting the fluid pump (10) is carried out upon occurrence of a failure.

24. (Currently Amended) A method according to claim 18, ~~wherein characterized in that~~, after the step (II), the piston stroke is operated in a constant way.

25. (Currently Amended) A method according to claim 24, ~~wherein characterized in that~~, after the step of operating the stroke in a constant way, ~~the~~ storage of the value of the maximum piston displacement at the electronic controller (16) is performed.

26. (Currently Amended) A method according to claim 24, ~~wherein characterized in that~~, after the step of operating the stroke in a constant way, the piston stroke is monitored.

27. (Currently Amended) A fluid pump controlling method, the fluid pump (10) comprising a piston displaceably positioned in a cylinder,

- the cylinder having a piston displacement stroke and
- the cylinder having a stroke end,
- ~~wherein the method being characterized by comprising comprises~~ the steps of:
 - (a) turning on the fluid pump (10), causing the piston to displace in the cylinder;
 - (b) successively ~~increment~~ incrementing the piston stroke as far as the occurrence of an impact thereof with the stroke end to store a maximum value of piston displacement,
 - (c) monitoring the piston stroke for a stabilization time between the successive increments of the stroke, and
 - (d) decrementing the piston stroke if an impact occurs during the stabilization time.

28. (Currently Amended) A method according to claim 27, ~~wherein characterized in that~~, in the step (a), the piston stroke of the fluid pump (10) is initiated with a minimum displacement stroke.

29. (Currently Amended) A method according to claim 28, ~~wherein characterized in that~~, after the step (d), the monitoring of the piston displacement is performed.

30. (Currently Amended) A linear compressor comprising a piston displaceably positioned in a cylinder, the cylinder having a piston displacement stroke and the cylinder having a stroke end, wherein the system being characterized by comprising comprises:

- a piston-position sensing assembly (11), and
- an electronic controller (16) electrically connected ~~associated~~ to the sensing assembly (11), the electronic controller (16) monitoring the piston displacement within the cylinder by detecting an impact signal, the impact signal being transmitted by the sensing assembly (11) upon occurrence of an impact of the piston with the stroke end, the impact signal being transmitted by the sensing assembly (11) to the electronic controller (16),

the electronic controller (16) successively incrementing the piston displacement stroke as far as the occurrence of the impact to store a maximum value of piston displacement.

31. (Currently Amended) An environment cooler, ~~characterized by~~ comprising a control system as defined in claim 1.